Claims

1. A collector for storage battery comprising a thin electrically-conductive ceramic layer formed on a collector substrate.

2. The collector for storage battery according to Claim 1, wherein a process involving the deposition from a gas phase is used to form said thin electrically-conductive ceramic layer on the surface of a collector substrate.

3. The collector for storage battery according to Claim 2, wherein said process involving the deposition from a gas phase is sputtering process.

4. The collector for storage battery according to Claim 2, wherein said process involving the deposition from a gas phase is plasma CVD process.

5. The collector for storage battery according to any one of Claims 1 to 4, wherein the material constituting said collector substrate is a metal or metal alloy selected from the group consisting of lead, lead alloy, tin, tin alloy, bismuth and bismuth alloy.

6. The collector for storage battery according to any one of Claims 1 to 4, wherein the material constituting said collector substrate is an electrically-conductive polymer.

7. The collector for storage battery according to any one of Claims 1 to 6, wherein as said electrically-conductive ceramic there is used SnO_2.

8. The collector for storage battery according to Claim 7, wherein said electrically-conductive ceramic SnO_2 comprises an Sb compound incorporated therein in an amount of from 0.5 mole % to 8 mole % based on the total amount of moles of Sn and Sb.

9. The collector for storage battery according to Claim 7 or 8, wherein said electrically-conductive ceramic SnO_2 comprises F incorporated therein in an amount of from 7 mole % to 60 mole % based on the total amount of moles of Sn and F.

10. The collector for storage battery according to any one of Claims 1 to 6, wherein as said electrically-conductive ceramic, any silicon compound selected from the group consisting of $TiSi_2$, Ti_5Si_3, $TaSi_2$, Ta_5Si_3, $NbSi_2$ and Nb_5Si_3 is used.

11. A lead acid battery comprising a collector for storage battery according to any one of Claims 1 to 9.

12. A lead acid battery comprising a collector for storage battery according to Claim 10.

13. A storage battery comprising a collector for storage battery according to any one of Claims 1 to 10,

characterized in that said collector has an active material provided thereon and there is provided a structure such that a pressure of 4×10^4 to 20×10^4 Pa is maintained perpendicular to the surface of said collector.

14. The storage battery according to Claim 13, comprising a bipolar battery type structure having a plurality of bipolar type electrodes each comprising a positive active material provided on one side of a collector for storage battery and a negative active material provided on the other side, wherein the positive active material side of one bipolar electrode being opposed to the negative active material side of another, and a separator for retaining an electrolyte provided between said laminated bipolar type electrodes.

15. The storage battery according to Claim 13, comprising one or two collectors for storage battery having an active material provided on one surface thereof but free of active material on the other surface, wherein the surface of said collector which is free of active material forms at least a part of the outer case of said storage battery.

16. A process for the production of a lead acid battery according to Claim 11, characterized in that formation begins within a period of time T (minute)

represented by the following equation after the injection of an electrolyte depending on the thickness of said coat layer of electrically-conductive ceramic (A μm):

$$T \text{ (min.)} \leq 19.2 \log_{10} A \text{ (μm)}$$

17. The process for the production of a lead acid battery according to Claim 16, wherein the electrode plate is subjected to formation with the battery voltage being controlled to 1.0 V/cell or more within T minutes after the injection of the electrolyte.

18. The process for the production of a lead acid battery according to Claim 16 or 17, wherein the electrode plate is subjected to formation with the battery voltage being controlled to 2.0 V/cell or less for at least 1 hour after the beginning of formation.

19. A process for the production of a storage battery comprising a collector for storage battery according to Claim 6, characterized in that said collector is heat-fused to a plastic battery outer case.